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Readers of Language Learning & Technology are undoubtedly aware of the debate raging through the international research community about open (i.e., free) access to research and knowledge. As readers of the journal, we may not feel very concerned with this debate, because when LLT was established in 1997 (and ALSIC Journal in 1998) it seemed natural that articles should be freely accessible from every part of the network. But this perspective is misleading. First, it is important to recognize that *LLT*, *Alsic*, and 2000 open access (OA) journals are the exception and not the rule among the 25,000 peer-reviewed journals. Secondly, like it or not, we are directly concerned individually as researchers at several levels.

- As readers, we face potential restrictions in access to publications and data in our field as well as to tools that could support our research and teaching.
- As authors we seek being published not only in journals that have good reputations but also that have a large audience so that our work can be cited. Citation is becoming an important feature of the research evaluation process of individuals as well as of institutions, and OA offers an impact advantage (OpCit, 2006).
- As citizens, when our salary and research are paid for out of public funds, we are often responsible for giving free access to our work as requested by research agencies, provided we can actually use our Intellectual Property Rights (IPR) and not forfeit their use when signing publishers' copyrights agreements.

We have the hardware and software solutions to guarantee open access. But social and economic models are well entrenched in the scientific publishing world. I would like to describe here, from a researcher's standpoint, two ways to open access: the so called "**green**" and "**gold**" roads to OA (open archives and OA journals) and the obstacles that stand in the way.

WHAT DOES OPEN ACCESS MEAN?

In January 2001, when more than thirty thousand researchers from 200 countries signed the Public Library of Science petition to urge the creation of a public world library where research could be freely accessible, observers were skeptical. The scientific publishing field was dominated by large-scale commercial publishers that were proud to announce outstanding profits, extracted from a market they controlled with "core" journals and access based on a "pay-per-view" model. At the same time, academic libraries were overwhelmed by substantial increases in journal subscription costs.

Less than three years after this symbolic gesture, broad discussion among actors of the scientific publishing world ensued. Public organizations in charge of funding and assessing research issued precise guidelines.

The Bethesda and Berlin declarations (Bethesda, 2003; Berlin, 2003), signed respectively in June and October, 2003, by several national research institutions from North America, Asia, and Europe, gave a straightforward definition of an "open access contribution," which must satisfy two conditions.

> 1) The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards will continue to provide the mechanism for enforcement of proper

> attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.
>
> 2) A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.

The reader will have noticed that the word "contribution" not only refers to publications but also to all source materials and data from which the original research findings are derived. This view strongly correlates with the argument made by the Research Councils in Humanities that, from a research methodological standpoint, we have a "special obligation to openness" since "sharing data strengthens our collective capacity to meet academic standards of openness by providing opportunities to further analyze, replicate, verify and refine research findings" (SSHRC, 2002), as did the pioneering work of the Perseus Project (1987 / 2007). Keeping in mind that all we are going to explain about open archives can be applied to publications as well as research data, we will limit our focus here to the former, taking into account its direct links with the burning question of individual scholarship evaluation (MLA, 2006)

However interesting the definition of open access contribution may be, it does not address the temporal constraints that are part of the research process. Between the date of the first draft of a paper and the eventual publication of the final version, several years may pass—even more if we consider the "moving wall" (i.e., the time lapse some publishers impose before an article can become open access). The time scale in Humanities may be different from that in Science, Technology and Medicine (STM), but the difference comes not so much from the time researchers have to wait before accessing a finding published by another colleague as from the life cycle of the result (results may become outdated after six months in biological research, whereas in the humanities a life cycle of 5-10 years is common). In CALL, for example, Jung's (2005) analysis showed that research orientations made significant moves within several years.

THE PARADIGM OF OPEN ARCHIVES

While public organizations issue statements on open access, academic librarians (among others) are ready to deploy online servers where researchers can deposit their work. The idea came from physicists, who created the first network called "open archives" in 1990. Researchers from the same discipline also invented the World Wide Web, with its protocol and language (HTML) oriented towards sharing publications. The current OA paradigm comprises four facets:

- A network linked to the Internet where contributions can be deposited, described, saved and accessed. There exist two kinds of servers within the network: data repositories, where actual contributions are stored, and data harvesters, where (meta)information on these scientific deposit can be retrieved, searched, reorganized, etc.
- A set of licenses that formulate the legal rights and duties between authors, readers and managers of the archives, guaranteeing permanent free access, non-profit use, and authorship acknowledgment.
- A communication protocol named OAI, which permits a coherent description of metadata associated with contributions (cf. metadata information sold with the Current Contents database).
- A standard free software package that assures inter-operability among the various kinds of servers and users' navigators.

Such a paradigm introduces a fairly formal (but easy to use) framework. OAI compliance means using the Open Archive Initiative's metadata-tagging protocol to tag the critical information (author, title, date, etc.)

in a uniform way. There is an official date of deposit, a unique permanent resource locator (no more invalid URLs!), and the author of the deposit is identified. A deposit is by no means an act of publication, but can and should be done during the process of publication. A researcher can deposit the first version of an article submitted to a journal (the "preprint" version) and/or the final peer-reviewed version (the one to be published by the journal). All versions of the same work will appear as inter-related in the archive.

There currently exist around 800 open archive repositories around the world (ROAR, 2007; OpenDOAR, 2007). As an illustration in education and ICT (Information and Communication Technology), see Edutice (2007). Developing countries are also involved (Bangalore, 2006). The infrastructure and technologies are well-developed, stable, and easy to use (Eprints, 2007).

Now that we have defined the framework, let's now consider the current publication practices.

THE EDITING AND PUBLISHING PROCESS

Scientific publication in the humanities differs from that in STM in several ways, and there are important discrepancies across disciplines and fields. When considering CALL, we noted that the time-sensitivity brings us closer to STM. Similarly, when considering the type of publication, monographs, prominent in the humanities, are only marginally present in CALL, where journal articles are the focus of attention. Table 1 lists some features of five CALL journals. Their types of publishers are similar to those encountered in the humanities: academic/university press (Recall), commercial publisher (Call), learned society (Calico), auto-publishing from academics (LLT and Alsic).

The editing/publication process is composed of three phases. 1) *editing*: work of the author when writing / revising the article (56% of the average cost of one article, see (Chanier, 2004) for details), and the reviewing process by researchers (11% of cost). 2) *document / media processing*: the final version of the document is transformed into several formats (Html, Xml, Pdf) and metadata are simultaneously generated (11% of cost). 3) *release*: library costs (22%, not including the subscription) ; with online versions it also means releasing the article on several websites where it could be accessed, searched, and cross-linked with other texts.

In terms of labor and costs, the lion's share of the editing/publishing process is in phases 1 and 3, work directly undertaken by academics. Publishing, as an act of communication within a knowledge community, is an essential component of research. The knowledge community (plus the community of practice with language teachers) around these five CALL journals can be readily circumscribed. These journals share similar selection processes, and their editorial boards and authors are comparable.

Phase 2 represents only a very minor part of the overall process. From a professional publishing standpoint, the processing in this part (tools, programs, norms and standards) all come from the academic world, most of them from the W3C and its subgroups. But managers of this phase (i.e., publishers) control the whole publication process and its outcomes. Let us examine some features of this situation, referring to Table 1.

The cost of document / media processing during phase 2, even if it is a minor one compared to the overall picture, does exist. In the case of *LLT* and *Alsic*, it is supported by academic institutions (and complemented by volunteer work). In other words, the academic funding is used to offer open access to readers. The other three journals function on a pay-per-view basis. *Calico* and *Recall* have comparable subscription rates, which should not be far from the real costs. Taylor & Francis, an international commercial publisher, multiplies its subscriptions rates by three to five times, in order to make a substantial profit. Multiplying rates by three is a common practice of commercial publishers in the humanities. The situation is even worse in some countries, where large amounts of money are spent by research agencies to "support" publications (India, China, Brazil, Spain, Italy, etc., but not so much in US, UK and Australia). In Canada, the *Social Sciences and Humanities Research Council of Canada* spends 2

million dollars to support 161 journals. In France, the *Centre National de la Recherche Scientifique* (CNRS) spends the equivalent of 80 full-time technicians to support 193 journals, practically all of them published by commercial companies. Hence research institutions pay several times the real cost of phase 2 to these publishers … and readers have to pay another time to access the articles!

Table 1. Overview of Publication Policies Among Five Peer-Reviewed CALL Journals

	Alsic	**Calico**	**Call**	**LLT**	**ReCall**
First issue	1998	1983	1988	1997	1989
Subscription indiv./instit.	free	$50 / $85	$140 / $449	free	$61 / $135
Publisher/Country	Alsic/France (academic)	Calico /USA	Taylor &Francis /UK	LLT/USA (academic)	Camb. Univ. Press/UK
Controlled by learned society	N/A	Calico	No	N/A	Eurocall
Print version	No	Yes	Yes	No	Yes
Online version: price per paper,	free	$10	$36	free	$15
Policy for open archive deposit	N/A	no mention*	moving wall: 18 months	N/A	yes, no moving wall
Copyright kept by author	Yes	??	No	Yes	No

Prices are in US dollars. Subscription rates do not include postage. They include online access, sometimes with no print version (for institution). Prices to access individual articles without subscription do not include taxes. It is not clear whether online access to *Call* is included in the subscription price for individuals (several years ago it was not).

* Calico has recently changed its web site. Free access used to be provided with a moving wall of 2-3 years. It is not clear whether that will still be true on the new site.

Publishers' power extends to other critical issues. For example, publishers decide usage of authors' IPR. Whereas *LLT* and *Alsic* leave the copyright to the author, Taylor & Francis and Cambridge University Press retain exclusive copyright. Using this transfer of rights, they then decide the Open Archive policy. Cambridge University Press lets the author deposit at any time. Taylor & Francis imposes a moving wall of 18 months after the publication/release date.[1]

ROADS TO OPEN ACCESS AND THE CURRENT SITUATION

The golden road to open access opened at the end of the 1990s with the creation of not-for-profit publishers supported by academic consortia, such as SPARC (2007) (an international alliance of academic and research libraries). They invented a new economic model for supporting the cost of publication, namely the "charges-to-author" one. Even some commercial publishers like BioMed Central have adopted this model, in which the reader gets free access to journals after the author has paid for being published, with fees adjusted to real costs. Although the "charges-to-author" principle is well known in the fields of biology and medicine, large segments of academia remain unaware of it.

As sociologists of science remind us, the research milieu is conservative. Researchers need to be aware of the cost of publication, the various scales of fees, and their corresponding impact on readers' access. Of course, given two journals of equal quality, it represents an extra decision for a researcher to wonder whether to submit her/his paper to a journal free for her/him (but with a fee for the reader) or to pay when being published in order to guarantee open access to readers. A growing number of research funding agencies around the world explicitly stress this choice in their contracts and let the researchers include the corresponding cost of publication in their research grants, giving a concrete reality to the motto

"publication costs are research costs." This economic model opens new perspectives, but related changes will come slowly.

The "green road" to open access also has to be considered seriously. Currently 15% of papers published each year are deposited in open archives (this percentage varies widely across disciplines). Extrapolations show that the goal of 100% may not be reached for many years. Studies have shown that researchers are ready to self-deposit when they are explicitly asked to do so. Thus, institutions and funders worldwide have begun adopting self-archiving policies (self-archiving mandates) for the projects and researchers they support (JULIET, 2006).

CONCLUSION

In this short tour around the scientific publication world, we have seen that free / open access to research findings has been officially acknowledged. But the traditional organization of scholarly publication runs against the objective of allowing the entire annual set of 2.5 million papers to be freely accessed. Thanks to recent academic initiatives, new models of scientific publication have emerged that offer direct open access to journals. They have gained support from various research agencies. This "gold" model for journals should be explored in every discipline, particularly in the Humanities, where large amounts of money are used to support publication. However, it will be a slow process.

Open archives (the "green road") represent the most efficient way of providing full open access through authors' self-deposits. New open archive services are under continuous development and will enhance research for the reader as well as for the author (Shadbolt, Brody, Carr, & Harnad, 2006). Already the researcher has the choice of depositing in institutional, disciplinary, or thematic repositories, all of which are being interconnected. Conforming to mandates issued from institutions and research agencies, the deposit has to provide the final version of the accepted paper. Access to the deposited article can at that time be set immediately as open access, or it can be set as closed access during any embargo period (6 to 12 months, maximum), with only its metadata freely accessible web-wide until the embargo period is over. During any embargo period, however, a powerful new feature of most repositories (namely, the "Email Eprint Request" button) makes it possible for individual users to semi-automatically and almost-instantaneously request an individual copy of the article by email, for individual use -- just as users had requested reprints by mail in paper days.

A final caveat: authors are encouraged to fix their own copyright statements before signing any transfer to the publisher. This can be easily done when sending the final version of a paper to the publisher, either by including a license such as the Creative Commons (2007) or by depositing a copy of the paper in an open archive repository, which establishes a similar license. As more and more authors take such action, research agencies will be encouraged to explicitly support better copyright policies and invite publishers to rephrase their own licenses[2]. But there is no need to wait until this happens because open access is a property of individual works, and proper attribution of authorship is not a question of copyright law but of community standards.

RECOMMENDED LINKS

Resources related to open access and scientific publication are numerous. Here is a selection of recommended links from which to start.

http://amsci-forum.amsci.org/archives/American-Scientist-Open-Access-Forum.html. *The American Scientist Open Access Forum*. The lively debate on open access was started in 1998 by Stephan Harnad.

http://www.eprints.org. *The web site of the Eprints project*. Links to main projects concerning open access, for downloading the free Eprints software for repositories, and the corresponding worldwide community.

http://www.wellcome.ac.uk/publications. *Economic analysis of scientific research publishing*. Report of SQW Ltd commissioned by the Wellcome Trust, January 2003. Wellcome Trust : London. The Wellcome Trust is an independent UK charity funding research to improve human and animal health.

NOTES

1. ROMEO (2007) is a web site which lists the OA policies of the vast majority of international scientific publishers, whatever types they are. More than 80% of them are "green" (they control 94% of the journals), which means that publishers say authors are free to deposit either preprint or post-print version of their papers in open archives. But, thinking back to the time issue, it makes a difference for the functioning of research, whether there is a moving wall or none.

2. See Science Commons (2007) for example of how publishers' licenses should be.

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Publications : http://edutice.archives-ouvertes.fr (Browse > By author > Chanier)

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Creative Commons (2007). Web site of the Creative Commons license for authors as individuals. http://creativecommons.org/license. See particularly the Creative Commons Attribution-Non-Commercial-Share Alike 2.5 License.

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